

**EPA Superfund
Record of Decision:**

**LEHIGH ELECTRIC & ENGINEERING CO.
EPA ID: PAD980712731
OU 01
OLD FORGE, PA
02/11/1983**

Text :

- SITE MANAGEMENT
- SITE CAPPING
- ON-SITE WASTE STABILIZATION (CHEMICAL DESTRUCTION)
- WASTE EXCAVATION WITH OFF-SITE DISPOSAL
- ON-SITE ENCAPSULATION
- ON-SITE WASTE INCINERATION
- ON-SITE BIODEGRADATION OF WASTE.

SEVERAL FACTORS USED IN SCREENING THE OPTIONS WERE:

- TECHNICAL FEASIBILITY
- COST EFFECTIVENESS
- ENVIRONMENTAL EFFECTIVENESS
- IMPLEMENTATION TIME FRAME.

AS A RESULT OF THE SCREENING PROCESS, THE FOLLOWING OPTIONS WERE EXCLUDED FROM BEING EVALUATED FURTHER (ALONE OR IN COMBINATION WITH OTHER OPTIONS) IN THE FEASIBILITY STUDY:

SITE CAPPING ONLY - DUE TO THE HIGH CONCENTRATIONS OF PCBS IN THE SOIL (UP TO 110,000 PPM), THE ESTIMATED QUANTITY OF PCBS ON-SITE (27.5 TONS), AND THE INCIDENCE OF MINE SUBSIDENCE IN THE AREA, THE LONG-TERM INTEGRITY OF A CAP SYSTEM IS QUESTIONABLE. THEREFORE, IT WAS DETERMINED THAT SITE CAPPING ALONE IS NOT AN ADEQUATE REMEDIAL MEASURE TO PROTECT PUBLIC HEALTH.

ON-SITE WASTE STABILIZATION - CHEMICAL DESTRUCTION OF PCB-CONTAMINATED SOIL IS IN THE EXPERIMENTAL STAGES AND IS UNPROVEN TECHNOLOGY.

ON-SITE WASTE INCINERATION - THERE ARE NO MOBILE INCINERATORS PERMITTED TO OPERATE IN PENNSYLVANIA. OPERATING COSTS WOULD ALSO BE EXCESSIVE MAKING THIS OPTION NOT COST-EFFECTIVE.

ON-SITE BIODEGRADATION OF WASTE - ALTHOUGH THIS METHOD HAS BEEN SHOWN TO BE EFFECTIVE FOR SOME TYPES OF HAZARDOUS WASTE, IT IS NOT A PROVEN TECHNOLOGY FOR USE WITH PCB CONTAMINATION AT THIS TIME.

THE REMAINING REMEDIAL OPTIONS WERE EVALUATED IN DETAIL (ALONE OR IN COMBINATION) IN THE FEASIBILITY STUDY AND WERE USED TO FORMULATE ALTERNATIVE SITE CLEAN-UP STRATEGIES. THE FEASIBILITY STUDY PUBLISHED BY WESTON (ATTACHMENT B) IDENTIFIES ALTERNATIVES FOR REMEDIAL ACTION AT THE LEHIGH ELECTRIC SITE. THESE ALTERNATIVES AND THEIR ASSOCIATED COSTS ARE PRESENTED BELOW:

ALTERNATIVE	ESTIMATED CAPITAL COST
1. NO ACTION	\$10,000
2. REMOVAL TO 10 PPM & SITE MANAGEMENT	\$7,546,000
3. REMOVAL TO 10 PPM & SITE CAPPING	\$7,725,000
4. REMOVAL TO 50 PPM & SITE MANAGEMENT	\$6,140,000
5. REMOVAL TO 50 PPM & SITE CAPPING	\$6,284,000
6. REMOVAL TO 50 PPM & ENCAPSULATION OF 10 TO 50 PPM ON-SITE	\$6,448,000
*7. REMOVAL TO 50 PPM WITH ADDITIONAL EXCAVATION WHERE COST-EFFECTIVE AND SITE MANAGEMENT (NUMBER 4 MODIFIED)	\$6,401,000

(O&M COSTS RANGE FROM \$34K TO \$54K FOR ALL OPTIONS EXCEPT "NO ACTION", WHICH IS \$135,000.).

EACH ALTERNATIVE EXCEPT "NO ACTION" REQUIRED AS A MINIMUM THE REMOVAL FROM THE SITE OF ALL SOIL WITH PCB CONCENTRATION OF 50 PPM OR GREATER. FURTHER, BASED ON THE RESULTS OF A PRELIMINARY ENDANGERMENT ASSESSMENT, IT IS DETERMINED THAT THE "NO ACTION" OPTION RESULTS IN UPPER LIMITS OF EXCESS CANCER RISK AND MEASURES OF REPRODUCTIVE RISKS WHICH ARE IN THE RANGES THAT GENERALLY CAUSE CONCERN. AS A RESULT, WE HAVE DETERMINED THAT THE "NO ACTION" OPTION IS NOT ACCEPTABLE.

PUBLIC INPUT

ON JANUARY 10, 1983, A PUBLIC MEETING AND A PRESS BRIEFING WERE CONDUCTED IN OLD FORGE, PENNSYLVANIA TO DESCRIBE THE VARIOUS ALTERNATIVES (THE ALTERNATIVES 1-6 ABOVE) AND TO DISCUSS THE PHASE II PORTION OF THE SITE CLEAN-UP. DURING THE PUBLIC COMMENT PERIOD WHICH FOLLOWED THE MEETING, WE RECEIVED LETTERS AND PETITIONS FROM THE COMMUNITY DEMANDING THAT WE IMPLEMENT THE ALTERNATIVE CALLING FOR REMOVAL TO 10 PPM WITH CAPPING AT AN ESTIMATED COST OF \$7,725,000. THEY INSISTED THAT THE LOWER THE CONCENTRATION LEVEL OF PCBS REMAINING ON SITE, THE LOWER THE RISK TO THE COMMUNITY WILL BE IN FUTURE YEARS.

* ALTERNATIVE 7 WAS ADDED TO THE FEASIBILITY STUDY AFTER THE PUBLIC COMMENT PERIOD, AND IN RESPONSE TO THE PUBLIC COMMENTS.

WE BELIEVE THAT IMPLEMENTATION OF ALTERNATIVE 3 WOULD NOT BE COST-EFFECTIVE. HOWEVER, AS A RESULT OF PUBLIC COMMENTS, WE DEvised A MODIFICATION TO ALTERNATIVE 4 (ALTERNATIVE 7, ABOVE) WHICH WOULD REDUCE THE CONCENTRATION LEVELS OF PCBS REMAINING ON SITE TO SUBSTANTIALLY BELOW 50 PPM FOR A FRACTION OF THE COST DIFFERENCE BETWEEN ALTERNATIVES 3 AND 4. THE MODIFICATION INCLUDES ADDITIONAL SOIL EXCAVATION BELOW THE 50 PPM CONCENTRATION LEVEL WHEN IT IS DETERMINED TO BE COST-EFFECTIVE.

ON JANUARY 31ST WE MET WITH CITIZEN LEADERS OF THE COMMUNITY (THE PCB COMMITTEE) TO DISCUSS THIS MODIFIED ALTERNATIVE. THEY REACTED POSITIVELY, AND WE BELIEVE THAT THEIR CONCERNS WILL BE SATISFIED IF THIS COST-EFFECTIVE METHOD FOR SITE CLEAN-UP IS IMPLEMENTED.

#RA
RECOMMENDED ALTERNATIVE

SECTION 300.68(J) OF THE NATIONAL CONTINGENCY PLAN (NCP) (47 FR 31180, JULY 16, 1982) STATES THAT THE APPROPRIATE EXTENT OF REMEDY SHALL BE DETERMINED BY THE LEAD AGENCY'S SELECTION OF THE REMEDIAL ALTERNATIVE WHICH THE AGENCY DETERMINES IS COST-EFFECTIVE (I.E., THE LOWEST COST ALTERNATIVE THAT IS TECHNOLOGICALLY FEASIBLE AND RELIABLE) AND WHICH EFFECTIVELY MITIGATES AND MINIMIZES DAMAGE TO AND PROVIDES ADEQUATE PROTECTION OF PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT. BASED ON OUR EVALUATION OF THE COST-EFFECTIVENESS OF EACH OF THE PROPOSED ALTERNATIVES, THE COMMENTS RECEIVED FROM THE PUBLIC, INFORMATION FROM THE SITE INVESTIGATION AND FEASIBILITY STUDY REPORTS, AND INFORMATION FROM THE STATE, WE DEVELOPED ALTERNATIVE 7 ABOVE. THIS ALTERNATIVE INCLUDES: EXCAVATION AND OFF-SITE DISPOSAL OF SOILS WITH A PCB CONCENTRATION OF 50 PPM OR GREATER; ADDITIONAL SOIL EXCAVATION AND REMOVAL WHERE COST-EFFECTIVE (I.E., SUBSTANTIAL PCB REMOVAL FOR SMALL INCREMENTAL COST INCREASE); DEMOLITION OF THE BUILDINGS ON-SITE; BACKFILLING, GRADING, AND VEGETATING OF THE SITE TO MINIMIZE EROSION AND TO CONTROL PERCOLATION AND RUN-OFF. WE HAVE DETERMINED THAT IMPLEMENTATION OF THIS ALTERNATIVE WILL EFFECTIVELY MITIGATE DAMAGE TO AND PROVIDE ADEQUATE PROTECTION OF PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT.

THE METHODOLOGY FOR DETERMINING WHETHER ADDITIONAL SOIL EXCAVATION IS COST-EFFECTIVE INVOLVES SUBDIVISION OF CERTAIN GRIDS (BASED UPON DATA FROM THE SITE INVESTIGATION REPORT) ONCE REMOVAL TO 50 PPM HAS BEEN ACHIEVED. SOIL SAMPLES WILL BE COLLECTED IN THE SUBGRIDS AND ANALYZED FOR PCB CONCENTRATION. THE GOVERNMENT'S ON-SITE REPRESENTATIVE (I.E., CORPS OF ENGINEERS INSPECTOR) WILL EVALUATE THE RESULTS AND DECIDE WHETHER OR NOT A SIGNIFICANT AMOUNT OF PCB-CONTAMINATED SOIL COULD BE REMOVED FROM THE SITE WITH LITTLE ADDITIONAL EXCAVATION AND COST.

THE CAPITAL COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE \$6,401,000. THE MONITORING AND MAINTENANCE COSTS ARE ESTIMATED TO BE \$46,000 (PRESENT WORTH VALUE) FOR A PERIOD OF THIRTY YEARS. A BREAKDOWN OF THE CAPITAL COSTS APPEAR IN ATTACHMENT E.

STATE INPUT

AFTER GIVING CAREFUL CONSIDERATION TO THE COST-EFFECTIVENESS OF EACH ALTERNATIVE AND EVALUATING THE PUBLIC COMMENTS EPA HAD RECEIVED, THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES RECOMMENDED THAT WE IMPLEMENT AN ALTERNATIVE (NOW DESIGNATED AS ALTERNATIVE 7) CALLING FOR REMOVAL OF SOIL WITH PCB CONCENTRATIONS OF 50 PPM OR GREATER WITH ADDITIONAL COST-EFFECTIVE EXCAVATION AND SITE MANAGEMENT. A LETTER CONFIRMING THE STATE'S DECISION APPEARS AS ATTACHMENT D.

#FA
PROPOSED ACTION

WE REQUEST YOUR APPROVAL OF THE REMOVAL TO 50 PPM WITH ADDITIONAL COST-EFFECTIVE EXCAVATION AND SITE MANAGEMENT AS THE REMEDIAL IMPLEMENTATION OPTION FOR THE PHASE II LEHIGH ELECTRIC SITE CLEAN-UP. IN ADDITION, WE REQUEST AN ALLOCATION OF \$6,401,000 FOR THE PROJECT. AN ALLOCATION OF \$300,000 FOR THE PREPARATION OF THE PLANS AND SPECIFICATIONS FOR THE CLEAN-UP HAS ALREADY BEEN MADE.

#SCH
TENTATIVE SCHEDULE

INITIATE DESIGN	FEBRUARY 1983
COMPLETE DESIGN	MAY 1983
INITIATE CLEAN-UP	AUGUST 1983
COMPLETE CLEAN-UP	DECEMBER 1983.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL ANTHONY S. BARTOLOMEO AT (FTS)597-9100. ATTACHMENTS.

#TMA
TABLES, MEMORANDA, ATTACHMENTS

ATTACHMENT C
PUBLIC COMMENTS

DURING THE PUBLIC COMMENT PERIOD OF THE FEASIBILITY STUDY REPORT, LETTERS WERE RECEIVED BY EPA FROM THE MAYOR AND COUNCILMEN OF THE BOROUGH OF OLD FORGE AND THE OLD FORGE PCB COMMITTEE. A PETITION WAS ALSO RECEIVED WITH APPROXIMATELY TWO HUNDRED SIGNATURES OF RESIDENTS FROM THE BOROUGH OF OLD FORGE.

BASICALLY, ALL CORRESPONDENCE ADDRESSES THE LEVEL OF PCB CONCENTRATIONS IN THE SOIL WHICH WILL BE LEFT ON-SITE. THE ALTERNATIVES EVALUATED IN THE FEASIBILITY STUDY WERE BASED UPON SOIL WITH PCB CONCENTRATIONS OF FIFTY PARTS PER MILLION AND TEN PARTS PER MILLION. THE COMMUNITY INSISTS THAT THE CLEAN-UP ALTERNATIVE SELECTED BE ONE WHICH CALLS FOR THE REMOVAL FROM THE SITE OF ALL SOILS WITH A PCB CONCENTRATION OF TEN PARTS PER MILLION OR GREATER.

THE ALTERNATIVE THAT THE REGION IS RECOMMENDING IS FOR REMOVAL OF SOILS FROM THE SITE BASED ON A FIFTY PARTS PER MILLION OR GREATER PCB CONCENTRATION, AND ADDITIONAL EXCAVATION AND REMOVAL WHERE IT IS DETERMINED TO BE COST-EFFECTIVE.

ON MONDAY, JANUARY 31ST, A MEETING WITH THE OLD FORGE PCB COMMITTEE WAS CONDUCTED TO EXPLAIN ALTERNATIVE 4 (MODIFIED). BASED UPON THEIR POSITIVE REACTION, WE BELIEVE THAT THIS ALTERNATIVE, IF CHOSEN TO BE IMPLEMENTED, WILL BE ACCEPTABLE TO THE PCB COMMITTEE AND THE COMMUNITY.

COPIES OF THE CORRESPONDENCE ARE INCLUDED IN THIS ATTACHMENT.

BOROUGH OF OLD FORGE
TOWN HALL

JANUARY 13, 1983

DEAR SIRs:

WE, THE ELECTED OFFICIALS OF THE BOROUGH OF OLD FORGE, PA., AFTER ATTENDING THE PUBLIC HEARING HELD BY THE EPA IN OLD FORGE ON JANUARY 10, 1983, REGARDING PHASE 2 OF THE CLEANUP OF "THE MOST GROSSLY CONTAMINATED" SITE ON THE EASTERN SEABOARD KNOWN AS LEHIGH ELECTRIC, AND AFTER HEARING THE PROS AND CONS OF THE METHODS FOR SUCH CLEANUP, HAVE DECIDED THAT THE BEST AND POTENTIALLY SAFEST METHOD FOR CLEANUP IS ALTERNATE NO. 3. WE ALSO AGREE THAT THE CONTAMINATED SOIL SHOULD BE REMOVED DOWN TO 10 PPM OR LESS. TO SETTLE FOR ANYTHING LESS THAN THIS WOULD NOT BE IN THE BEST INTERESTS OF OUR CONSTITUENTS.

WE ARE GIVING THE PCB COMMITTEE AND THE PEOPLE WHO RESIDE NEAR THE LEHIGH ELECTRIC SITE OUR FULL SUPPORT AND ARE IN COMPLETE AGREEMENT WITH THE FACTS SET FORTH IN THE ENCLOSED LETTER.

SINCERELY.

MINORITY CAUCUS SECRETARY
SENATE OF PENNSYLVANIA

JANUARY 20, 1983

MR. ANTHONY S. BARTOLOMEO
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
PHILADELPHIA, PA 19106

RE: PHASE II, CLEANUP
LEHIGH ELECTRIC SITE
OLD FORGE, PA

DEAR MR. BARTOLOMEO:

AS THE STATE SENATOR REPRESENTING LACKAWANNA COUNTY AND SPECIFICALLY THE BOROUGH OF OLD FORGE AND AFTER HEARING THE REPORT BY MY ASSISTANT WHO ATTENDED THE PUBLIC HEARING HELD BY THE EPA IN OLD FORGE ON JANUARY 10TH REGARDING PHASE II OF THE CLEANUP OF THE LEHIGH ELECTRIC SITE, I WOULD LIKE TO GO ON RECORD AS SUPPORTING ALTERNATE #3 AS THE BEST AND POTENTIALLY SAFEST METHOD FOR CLEANUP.

I AGREE WHOLEHEARTEDLY WITH THE P.C.B. COMMITTEE AND OLD FORGE BOROUGH OFFICIALS THAT THE CONTAMINATED SOIL SHOULD BE REMOVED DOWN TO 10 PPM OR LESS. IN ADDITION THERE SHOULD BE SITE CAPPING ALONG WITH THE DEMOLITION OF ON-SITE BUILDINGS.

I AM GIVING THE P.C.B. COMMITTEE AND THE CITIZENS OF OLD FORGE MY FULL SUPPORT AND STAND READY TO ASSIST THEM IN THEIR QUEST FOR A CLEANER AND ENVIRONMENTALLY SAFE COMMUNITY.

SINCERELY,

ROBERT J. MELLOW.

JANUARY 11, 1983

MR. ANTHONY S. BARTOLOMEO
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
PHILADELPHIA, PENNSYLVANIA 19106

DEAR MR. BARTOLOMEO:

WE, OF THE PCB COMMITTEE, ARE WRITING IN BEHALF OF THE RESIDENTS OF OLD FORGE, PA., WHOSE BACKYARDS ARE ADJACENT TO WHAT EPA HAS TERMED "THE MOST GROSSLY CONTAMINATED SITE ON THE EASTERN SEABOARD" -- LEHIGH ELECTRIC. AFTER MEETING WITH THE PEOPLE OF THIS NEIGHBORHOOD, WHO HAVE BEEN VICTIMIZED FOR THE PAST 25 YEARS DUE TO THEIR 24 HOUR - 7 DAY A WEEK EXPOSURE TO THE DREADED HAZARDOUS TOXIC CHEMICAL PCB.

WE HAVE BANDED TOGETHER AND ARE NOT REQUESTING, BUT DEMANDING, OUR CONSTITUTIONAL RIGHTS NOT BE VIOLATED BY EPA. WE FEEL THAT THE ONLY SAFE LEVEL OF PCB IN THE SOIL AT LEHIGH ELECTRIC SHOULD BE ZERO TO BE CONSIDERED ENVIRONMENTALLY SAFE; BUT BEING REALISTIC ENOUGH TO REALIZE THAT THIS SOIL CAN NEVER BE RETURNED TO ITS NATURAL STATE, THE ONLY LEVEL WE CAN ACCEPT IS 10 PPM OR LESS. IF THE ACCEPTED LEVEL TO BE LEFT IN THE SOIL AT LEHIGH ELECTRIC AFTER PHASE II IS TO BE ANYTHING HIGHER, THIS NEIGHBORHOOD WILL LIVE IN FEAR AND SEVERE MENTAL ANGUISH FOR THE REST OF OUR NATURAL LIVES. SINCE NO ONE CAN ACTUALLY COME FORWARD AND TELL US WHAT LEVELS ARE SAFE AND HOW MANY PARTS PER MILLION ARE ACCEPTABLE, WE HAVE CONFERRED WITH THE RESIDENTS AND HAVE AGREED TO COOPERATE AND COMPROMISE WITH EPA. WE HAVE ACCEPTED THE DECISION OF THE RESIDENTS THAT THE ONLY LEVEL THEY CAN AGREE UPON (KNOWING THAT THIS MAY NOT BE SAFE ENOUGH) IS 10 PPM OR LESS. (REMOVE SOIL TO 10 PPM OR LESS AND SITE CAPPING).

ALTERNATIVE METHOD NO. THREE (3).

OUR CHILDREN'S LIVES ARE AT STAKE AND THEIR CHILDREN'S LIVES, ETC. WE CANNOT ALLOW THIS -- IF WE DID WE WOULD FEEL ASHAMED AND HUMILIATED THAT WE DID NOT DO EVERYTHING IN OUR POWER TO PROVIDE THE SAFEST ENVIRONMENT POSSIBLE FOR OUR FUTURE GENERATIONS. EPA CANNOT GIVE US ANY WRITTEN GUARANTEES ABOUT OUR FUTURE, AND WE ARE INTELLIGENT ENOUGH NOT TO ASK FOR ANY, BECAUSE THERE ARE NO GUARANTEES IN THIS LIFE -- BUT THERE IS SUCH A THING AS PREVENTIVE MEASURES, AND THAT IS ALL WE ARE ASKING FOR.

EPA CAN ONLY SPECULATE THAT THE CLEAN UP MEASURE THEY PLAN TO PUT INTO EFFECT FOR LEHIGH ELECTRIC WILL BE ENVIRONMENTALLY SAFE, BUT THAT IS ALL THEY CAN DO -- THEY CANNOT TELL US WHAT MAY HAPPEN 10, 20, 50 OR 100 YEARS FROM NOW. WE MUST LOOK TOWARD THE FUTURE. OUR FOREFATHERS PAVED THE WAY FOR US -- FOR US TO LEAVE A LEGACY OF A POTENTIAL LIFE OF SICKNESS, BIRTH DEFECTS AND UNTIMELY DEATHS WOULD BE LUDICROUS. THIS WE CANNOT AND WILL NOT ALLOW. IF EPA FEELS THAT 50 PPM IS A SAFE LEGACY FOR FUTURE GENERATIONS, WE FEEL THAT EPA SHOULD MAKE THIS CREDIBLE AND PUT THEIR BELIEFS IN WRITING SO THAT THIS NEIGHBORHOOD CAN BE RELIEVED OF SOME OF THE FEAR AND MENTAL ANGUISH THAT IT IS NOW EXPERIENCING. WE FEEL THAT THIS IS A LEGITIMATE REQUEST. IF EPA REFUSES TO DO THIS, SOMETHING IS AMISS. ANYTHING THAT WE BELIEVE IN, WE ARE NOT AFRAID TO COMMIT OURSELVES TO BY PUTTING THESE BELIEFS AND FACTS ON PAPER (SUCH AS THIS LETTER).

THIS NEIGHBORHOOD HAS SUFFERED ENOUGH. REMOVE THE PRICE TAG FROM OUR HEADS AND ALLOW US TO RETURN TO OUR LIVES ON AN ALMOST NORMAL BASIS AGAIN -- FOR WE CAN NEVER GO BACK TO THE HAPPY-GO-LUCKY PEOPLE WE ONCE WERE. ENOUGH IS ENOUGH. WHY DOES EPA INSIST ON PUNISHING US, THE INNOCENT VICTIMS? EVEN THOUGH WE HAVE REACHED THE END OF OUR ROPE, WE ARE GOING TO TIE A KNOT AND HANG ON. WE ARE THROUGH BEING PAWNS IN EPA'S MANIPULATIVE GAMES, AND REFUSE TO BE USED ANY LONGER AS STEPPING STONES WHILE EPA TRIES TO CLEANSE ITS REPUTATION. IT IS TIME FOR THEM TO REVERSE THIS POLICY AND USE THIS TIME AND ENERGY TOWARDS CLEANSING ALL THE HAZARDOUS TOXIC CHEMICALS THAT ARE SLOWLY DESTROYING THE PEOPLE OF THIS COUNTRY. WE WILL NO LONGER TOLERATE THEIR HURRY UP AND WAIT FOREVER POLICY. THE TIME HAS NOW COME FOR EPA TO JUSTIFY ITS NAME -- ENVIRONMENTAL PROTECTION AGENCY. WORDS WITHOUT RESULTS ARE MEANINGLESS.

THROUGH WHAT EPA QUOTES AS BEING "SCIENTIFIC EXPERTISE", THEY HAVE SET STANDARDS AND DEEMED CERTAIN CONCENTRATIONS AS SAFE LEVELS. BUT WE RESEARCHED ENOUGH TO KNOW THAT SCIENCE HAS NOT FOUND ANY LEVELS THAT CAN BE CONSIDERED SAFE. WE ARE SURE THAT YOU ARE FULLY AWARE THAT SCIENCE IS A PRACTICE, NOT AN ART. THE BURDEN OF PROOF DOES NOT REST WITH US, BUT WITH THE ENVIRONMENTAL PROTECTION AGENCY.

DUE TO THE CUMULATIVE NATURE OF PCB'S WHEN CONSIDERED IN RELATION TO THE YOUNG AGES OF OUR CHILDREN, IN ALL LOGIC CALCULATES TO SERIOUS HEALTH PROBLEMS THAT CAN OCCUR AFTER A LIFETIME OF EXPOSURE. SO YOU CAN UNDERSTAND WHY WE DO NOT APPRECIATE EPA'S SPECULATIONS. THESE SPECULATIONS MAY BE CONSIDERED "SCIENTIFIC EXPERTISE" IF THEY WERE TO BE APPLIED TO COMMODITIES, THE MONEY MARKET, ETC. EVEN THEN THEY ARE STILL GAMBLING -- BUT TO GAMBLE AWAY HUMAN LIVES THROUGH SPECULATION -- FOR SHAME.

EPA HEAVILY EMPHASIZES THE CRADLE TO THE GRAVE PHILOSOPHY PERTAINING TO HAZARDOUS TOXIC WASTE. WE BELIEVE THIS EPA SAYING TO MEAN SEEING SUCH WASTES FROM CONTAMINATED SITES SAFELY DELIVERED AND PUT INTO APPROVED LANDFILLS. BECAUSE EPA SPEWS COST EFFECTIVENESS FIRST AND HUMAN LIFE LAST, WE CAN ONLY ASSUME THAT THEY

INTERPRET THIS PHILOSOPHY AS MEANING PUTTING OUR CHILDREN FROM THE CRADLE INTO THE GRAVE. THE FEDERAL GOVERNMENT SPENDS MILLIONS OF DOLLARS TO PROTECT WILDLIFE AND ANIMALS THAT THEY CONSIDER TO BE RAPIDLY BECOMING EXTINCT. (WE ARE ALL FOR THIS). YET WE CANNOT UNDERSTAND THEIR LOGIC WHEN THEY REFUSE TO SPEND AN EXTRA MILLION DOLLARS TO KEEP OUR FUTURE GENERATIONS FROM BECOMING EXTINCT. WE WOULD BE LIVING A LIE THE REST OF OUR LIVES IF WE AGREED TO SETTLE FOR ANYTHING MORE THAN 10 PPM OR LESS DURING PHASE II OF CLEAN UP AT THE LEHIGH ELECTRIC SITE. YOU CAN SURELY COMPREHEND THAT WE CANNOT, WE WILL NOT ACCEPT, FROM AN AGENCY CREATED TO PROTECT US, ANYTHING LESS THAN REMOVING THE CONTAMINATED SOIL DOWN TO 10 PPM OR LESS. WE ARE JUSTIFIED UNDER THE CIRCUMSTANCES IN DEMANDING OUR CONSTITUTIONAL RIGHTS AND WE WILL NOT ALLOW EVEN EPA TO TAKE THESE RIGHTS AWAY FROM US.

EVEN THOUGH EPA MAY HAVE OUR BEST INTERESTS AT HEART, WHO BETTER THAN THE PEOPLE THAT MUST LIVE HERE THE REST OF OUR LIVES, SHOULD DETERMINE WHAT IS BEST FOR THEM. REMEMBER, IT ISN'T AS THOUGH WE ARE FORTUNATE ENOUGH TO HAVE JUST VISITED THE LEHIGH ELECTRIC SITE, EXTEND OUR SYMPATHY, AND THEN BE ABLE TO LEAVE.

WE ARE SURE YOU UNDERSTAND THE GRAVITY OF THE SITUATION, AND WILL DO THE JUST AND PROPER THING BY HONORING OUR JUSTIFIABLE DEMANDS.

SINCERELY,

THE PCB COMMITTEE

MARIE SKUTACK
LUCILLE YAGER
ANN MARIE JORDAN
HELEN TANSLEY
RUTH CHIPP
ROBERTA SKUTACK

P.S. CAN YOU BLAME US? IF YOU WERE IN OUR SHOES, WHICH FORTUNATELY YOU ARE NOT, WOULDN'T YOU FIGHT TOOTH AND NAIL TO PRESERVE HUMAN LIVES, AND ECHO THE SENTIMENTS OF THIS VICTIMIZED NEIGHBORHOOD?

ATTACHMENT D

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

FEBRUARY 2, 1983

(717)787-9871

MR. ANTHONY S. BARTOLOMEO
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
SIX AND WALNUT STREETS
PHILADELPHIA, PA 19106

DEAR MR. BARTOLOMEO:

THE DEPARTMENT OF ENVIRONMENTAL RESOURCES, BUREAU OF SOLID WASTE MANAGEMENT HAS COMPLETED ITS EVALUATION OF PHASE II REMEDIAL ACTION ALTERNATIVE FOR THE LEHIGH ELECTRIC SITE CONTAINED IN THE NOVEMBER, 1982 REMEDIAL FEASIBILITY REPORT PREPARED BY ROY F. WESTON, CONSULTING ENGINEERS.

IT IS OUR OPINION BASED UPON THE DOCUMENTATION CONTAINED IN THE FEASIBILITY REPORT AND THE ADDITIONAL DATA PROVIDED TO DER BY EPA ON JANUARY 31, 1983, THAT THE MOST APPLICABLE REMEDIAL CLEAN-UP OPTION FOR THIS SITE IS MODIFICATION OF ALTERNATIVE 4. THE BUREAU BELIEVES THAT THE ENVIRONMENTAL EFFECTIVENESS AND TECHNICAL FEASIBILITY OF THIS MODIFIED ALTERNATIVE, COUPLED WITH THE LONG-TERM OPERATION AND MAINTENANCE RESPONSIBILITIES OF THE COMMONWEALTH PROVIDE A RELIABLE, PRACTICAL AND IMPLEMENTABLE SOLUTION FOR THE SITE.

THE REMOVAL OF THE TRANSFORMERS, ELECTRICAL EQUIPMENT, AND MISCELLANEOUS WOOD AND DEBRIS DURING THE FIRST PHASE OF THIS PROJECT DISTURBED SURFACE SOILS AND THE ORIGINAL GRID STAKES. BECAUSE OF THIS FACT AND THE NEED TO ENSURE THAT THE IMPLEMENTATION OF THIS CLEAN-UP ALTERNATIVE REMOVES THE PCB CONTAMINATED SOILS TO A LEVEL OF 50 PPM OR LESS, WE BELIEVE ALTERNATIVE 4 SHOULD BE MODIFIED TO INCLUDE THE REMOVAL OF A MINIMUM OF 6" OF SOIL FROM THE ENTIRE PROPERTY (THE HOT AREA) CURRENTLY BOUNDED BY THE FENCE. MOREOVER, CONSIDERATION SHOULD BE GIVEN TO THE REMOVAL OF EXTRA CONTAMINATED SOILS WHERE IT IS COST EFFECTIVE, I.E., BEYOND THE DEPTHS SPECIFIED IN ALTERNATIVE 4 AND THE SUPPORTING DOCUMENTATION.

A QUALITY ASSURANCE PROGRAM APPROVED BY DER AND EPA MUST BE DEVELOPED AND UTILIZED BY THE SELECTED CLEAN-UP CONTRACTOR AT THIS SITE TO INSURE THAT THE CLEAN-UP OBJECTIVE IS MET. IN LIGHT OF THE PHYSICAL LOCATION OF THIS SITE, THE ISSUES OF FLOODING AND MINE SUBSIDENCE MUST BE SPECIFICALLY ADDRESSED IN THE DESIGN TO BE APPROVED BY OUR AGENCIES TO ENSURE THAT THE INTEGRITY OF THE ALTERNATIVE FINALLY SELECTED IS NOT COMPROMISED.

IT SHOULD BE FURTHER UNDERSTOOD THAT ONCE AN ALTERNATIVE FOR THE CLEAN-UP OF THIS SITE IS FINALLY SELECTED BY OUR PERSPECTIVE AGENCIES, THE NATURE AND EXTENT OF OPERATION AND MAINTENANCE ACTIVITIES WILL BE JOINTLY AGREED UPON BY DER AND EPA FOR THIS SITE.

IF YOU HAVE ANY QUESTIONS OR COMMENTS ON THE RECOMMENDED ALTERNATIVE OR OTHER REMARKS CONTAINED IN THIS CORRESPONDENCE, PLEASE DO NOT HESITATE TO CONTACT ME.

SINCERELY,

JAMES P. SNYDER, ASSISTANT DIRECTOR
BUREAU OF SOLID WASTE MANAGEMENT.

ATTACHMENT E

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
1) REGULATED SOIL FOR SECURE DISPOSAL (1)	19,300 TONS (13,000 CY)	\$ 170/TON	\$ 3,281,000
2) LOW LEVEL SOIL FOR OFF-SITE DISPOSAL (2)	600 TONS (400 CY)	\$ 170/TON	\$170,000
3) LOW LEVEL SOIL FOR ON-PROPERTY BURIAL	1,500 TONS (1,500 CY)	\$ 6/TON	9,000
4) TRACE SOIL FOR ON-PROPERTY BURIAL	2,100 TONS (1,400 CY)	\$ 6/TON	12,600
5) ADDITIONAL SOIL FOR OFF-SITE DISPOSAL	1,800 TONS (1,200 CY)	\$ 170/TON	306,000
6) WASTEWATER	920,000 GAL	\$ 0.15/GAL	138,000
7) STRUCTURE DEMOLITION AND PLACEMENT OF RUBBLE AND GRAVEL (3)	LS		70,000
8) SECURE DISPOSAL/DECONTAMINATION OF MISCELLANEOUS CONCRETE PADS	72 TONS	\$ 208/TON	15,000
9) CLEAN BACKFILL	11,800 CY	\$ 12/CY	161,400
10) OFF-SITE DISPOSAL OF WOOD/ROOFING/STEEL	LS		6,000
11) CLEANING, DRAIN HOLE INSTALLATION AND SEALING CONCRETE SURFACES	LS		29,500
12) SITE CAPPING AREA	0		
13) ENCAPSULATION CONTROL AREA	0		
14) ADDITIONAL EXCAVATION/PLACEMENT AND COMPACTION OF FILL REQUIRED FOR ENCAPSULATION AREA	0		
15) TOPSOIL/SEEDING/EROSION CONTROL	23,000 SY	\$ 2.50/SY	57,500
16) DRAINAGE SWALE	LS		7,400
17) FENCING	LS		18,200
18) FLOOD CONTROLS	LS		12,000
19) CLEARING	LS		10,000
20) ON-SITE LAB MOBILIZATION AND DEMOLITION	LS		12,000
21) SOIL TESTING	270 SAMPLES	\$ 50/SAMPLE	13,500
22) MONITORING WELL NEW CONSTRUCTION/BACKFILLING OF EXISTING NOT REQUIRED WELLS	6 WELLS	\$ 250/WELL	1,500

23) SOIL COVER FOR FOUNDATION OF BUILDINGS 1 AND 3 (INCLUDES FLOW ZONE) (5)	30,000
SUBTOTAL	\$ 4,360,800
MOBILIZATION, DEMOBILIZATION, AND SITE SERVICES (22%)	595,400
SUBTOTAL	\$ 5,320,200
INSURANCE, BONDS, PERMITS (2%)	106,000
OVERHEAD AND PROFIT (10%) (4)	156,000
SUBTOTAL	\$ 5,582,200
CONTINGENCY (15%)	813,800
TOTAL	\$ 6,401,000

1. IF AN INCINERATION FACILITY IS USED FOR DISPOSAL OF REGULATED SOILS, THE FOLLOWING COST ESTIMATE REVISIONS APPLY:
 - ITEM 1 UNIT COST = \$ 1,470/TON
 - ITEM 1 TOTAL COST = \$28,300,000
2. IF A SOLID WASTE LANDFILL IS DESIGNED FOR DISPOSAL OF LOW LEVEL SOILS, THE FOLLOWING COST ESTIMATE REVISIONS APPLY:
 - ITEM 2 UNIT COST = \$ 30/TON
 - ITEM 2 TOTAL COST = \$ 18,000
3. INCLUDES FILLING TWO ON-SITE TUNNELS
4. NOT APPLIED TO DISPOSAL COSTS FOR SOILS (ITEMS 1, 2, AND 5)
5. SEE APPENDIX FOR DETAILS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

JANUARY 31, 1983

MR. PETER N. BIBKO
REGIONAL ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
SIXTH AND WALNUT STREETS
PHILADELPHIA, PA 19106

DEAR MR. BIBKO:

THIS IS TO CONFIRM THE INTENT OF THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES TO PROVIDE FOR ITS 10% STATE SUPERFUND MATCH FOR PHASE 2 REMEDIAL ACTION ACTIVITIES AT THE LEHIGH ELECTRICAL SITE IN LACKAWANNA COUNTY. IT IS UNDERSTOOD THAT THE EXACT AMOUNT OF FUNDING IS NOT PRECISELY KNOWN AT THIS TIME, BUT WILL BE DETERMINED MORE ACCURATELY AFTER A FINAL REMEDIAL ACTION ALTERNATIVE IS CHOSEN AND JOINTLY AGREED UPON BY DER AND EPA. PRECISE REMEDIAL ACTION COSTS AND THE ASSOCIATED 10% STATE SHARE WILL BE AGREED UPON IN A CONTRACT THAT WE ANTICIPATE EXECUTING WITH EPA PRIOR TO COMMENCING REMEDIAL ACTIVITIES AT THE LEHIGH ELECTRIC SITE.

I BELIEVE THAT THE FOREGOING INFORMATION IS SUFFICIENT TO INDICATE THIS DEPARTMENT'S INTENT TO ASSURE STATE FUNDING AND ENTER A CONTRACT FOR THE LEHIGH ELECTRIC SITE. IF YOU HAVE ANY QUESTIONS OR COMMENTS, PLEASE CONTACT EITHER DWIGHT WORLEY, CHIEF, DIVISION OF OPERATIONS, AT 717-787-7383 OR JAMES P. SNYDER, ASSISTANT DIRECTOR, BUREAU OF SOLID WASTE MANAGEMENT, AT 717-787-9871.

SINCERELY,

WILLIAM B. MIDDENDORF.

FEBRUARY 10, 1983

I. INTRODUCTION

THE PURPOSE OF THIS DOCUMENT IS TO PROVIDE AN ESTIMATE OF THE RISK ASSOCIATED WITH THE PCB CONTAMINATION AT THE LEHIGH ELECTRIC CO. SITE NEAR OLD FORGE, PA. THE PAPER INCLUDES A DISCUSSION OF THE REDUCTION IN RISK LIKELY TO RESULT FROM THE PLANNED REMEDIAL ACTION.

THE LEHIGH ELECTRIC CO. SITE HAS BEEN UNDER STUDY AS A SUPERFUND SITE FOR MORE THAN 2 YEARS. THE SITE HAD BEEN USED AS AN UNSHELTERED STORAGE LOCATION FOR MANY PIECES OF ELECTRICAL EQUIPMENT; E.G. TRANSFORMERS AND CAPACITORS. OVER A PERIOD OF TIME, THE CONTAINERS WERE BREACHED AND HIGH CONCENTRATIONS OF POLYCHLORINATED BIPHENYLS (PCBS) SPILLED ONTO THE GROUND.

THE AGENCY INITIALLY ERECTED A FENCE AROUND THE CONTAMINATED AREA IN APRIL 1981. SINCE THEN, ACTION HAS BEEN TAKEN TO REMOVE PCBS FROM THE SITE. IN PHASE I THE MAJOR PIECES OF ELECTRICAL EQUIPMENT WERE REMOVED AND DISPOSED OF. IN PHASE II THE AGENCY OBTAINED VERTICAL PCB CONCENTRATION PROFILES FROM SAMPLE BORINGS TAKEN FROM 50' X 50' GRID SECTIONS LAID OUT ON THE SITE. FURTHER, GROUND WATER MONITORING WELLS WERE DRILLED AND SAMPLED FOR PCBS, AND WATER AND SEDIMENT SAMPLES FROM THE NEARBY LACKAWANNA RIVER WERE ANALYZED FOR POSSIBLE PCB CONTAMINATION.

THE AGENCY HAS NOW CONSIDERED A NUMBER OF OPTIONS FOR FURTHER REMEDIAL WORK AT THE SITE. THIS DOCUMENT ASSESSES THE RISK ASSOCIATED WITH THE CURRENT SITUATION, THE "NO ACTION OPTION", AND IN A MORE GENERAL MANNER, THE RISK ASSOCIATED WITH A VIGOROUS REMEDIAL OPTION.

THE RISK THAT EXISTS IN A GIVEN SITUATION IS A FUNCTION OF THE HAZARD(S) OF THE SUBSTANCE(S) INVOLVED AND THE EXPOSURE TO THOSE TOXICANTS WHICH THE TARGET (OFTEN HUMANS) MAY ENCOUNTER.

THEREFORE, THIS DOCUMENT CONSISTS OF SECTIONS DEVOTED TO HAZARDS OF PCBS, LIKELY EXPOSURE TO PCBS AT THE LEHIGH ELECTRIC CO. SITE, AND THE ANTICIPATED RISK. WHILE CONSIDERABLE INFORMATION IS AVAILABLE ON THE TOXICITY OF PCBS (I.E. HAZARD INFORMATION), OUR KNOWLEDGE IS CERTAINLY NOT COMPLETE. SIMILARLY, OUR KNOWLEDGE OF FACTORS AFFECTING POTENTIAL EXPOSURES IS ALSO IMPERFECT. CONSEQUENTLY, IT IS NECESSARY TO MAKE CERTAIN ASSUMPTIONS IN ORDER TO FILL IN THESE DATA GAPS: A CONSCIOUS EFFORT HAS BEEN MADE TO MAKE THESE ASSUMPTIONS IN SUCH A WAY THAT THEY WILL ERR ON THE SIDE OF PUBLIC SAFETY. THESE ASSUMPTIONS ARE SUMMARIZED IN TABLES IN THE SECTIONS THAT FOLLOW. NOTE: ANY ATTEMPT TO INTERPRET THE RESULTS OF THIS RISK ASSESSMENT WITHOUT A FULL APPRECIATION OF THESE ASSUMPTIONS WOULD CONSTITUTE A MISUSE OF THIS INFORMATION.

II. HAZARD INFORMATION

BOTH ANIMAL EXPERIMENTATION AND HUMAN EXPERIENCE ATTEST TO THE TOXICITY OF PCBS. GIVEN THE 10 DIFFERENT HOMOLOGUES POSSIBLE, MANY WITH A LARGE NUMBER OF ISOMERS, THE PROBLEM OF SPECIFYING THE TOXICITY OF EACH CONGENER IS A CHALLENGE WHICH HAS YET TO BE MET, LET ALONE ADDRESSING THE QUESTION OF SYNERGISM WHICH MAY APPEAR IN THE COMPLEX MIXTURES WE CALL "PCBS". MOST PCBS ENTERED THE ENVIRONMENT AS COMPONENTS OF ELECTRICAL EQUIPMENT COOLANTS/DIELECTRICS WHICH WERE OF GENERALLY WELL DEFINED COMPOSITION; E.G. ARACHLORS AND KANECHLORS. MANY OF THE STUDIES HAVE BEEN CONDUCTED WITH THESE ELECTRICAL USE MIXTURES, THE MOST LIKELY SOURCE OF CONTAMINATION AT THE LEHIGH SITE. A NUMBER OF THOROUGH REVIEWS OF THIS TOPIC HAVE BEEN PUBLISHED.

A. HUMAN DATA

THE MAJORITY OF PEOPLE LIVING IN THE UNITED STATES CARRY DETECTABLE LEVELS OF PCBS IN THEIR BODIES. THE SOURCES OF THESE SUBSTANCES INCLUDE OCCUPATIONAL EXPOSURE AND DIETARY INTAKE. THE EFFECTS OF THESE LOW LEVELS IN THE BODY ARE GENERALLY UNKNOWN, BEING MASKED, IF PRESENT, BY EXPOSURES TO A MYRIAD OF OTHER INSULTS AND NATURAL PROCESSES IN ADDITION TO PCBS.

IN SOME CASES, HOWEVER, HIGH, INADVERTENT EXPOSURES HAVE RESULTED IN MANIFEST EFFECTS ATTRIBUTABLE TO PCBS AND/OR THEIR CONTAMINANTS. IN THE 1960S AND 1970S A GROUP OF JAPANESE AND A GROUP OF TAIWANESE WERE INDEPENDENTLY EXPOSED TO PCBS IN CONTAMINATED COOKING OIL. AMONG THE CLINICAL SYMPTOMS WHICH RESULTED WERE CHLORACNE (A PERSISTENT FORM OF ACNE), EYE DISCHARGES, SKIN DISCOLORATION, LIVER DYSFUNCTION, ABDOMINAL PAIN, AND NEUROLOGICAL PROBLEMS. SOME CHILDREN BORN TO EXPOSED MOTHERS EXHIBITED A TEMPORARY SKIN DISCOLORATION. THE EXPOSED POPULATIONS CONTINUE TO BE FOLLOWED TO ASSESS ANY CHRONIC EFFECTS.

B. ANIMAL DATA

ANIMAL STUDIES HAVE THE ADVANTAGE OF CONTROLLED EXPOSURES WHICH PERMIT THE DETERMINATION OF DOSE-EXPOSURE RELATIONSHIPS. A DISADVANTAGE IS THAT THE RESULTS OBTAINED FROM THE NON-HUMAN MUST BE EXTRAPOLATED TO THE HUMAN SITUATION.

MANY PCB STUDIES HAVE BEEN CONDUCTED USING SEVERAL ANIMALS SPECIES. THE EFFECTS NOTED ARE SIMILAR TO THOSE OBSERVED WITH A WIDE VARIETY OF CHLORINATED POLYCYCLIC AROMATIC SUBSTANCES; PARTICULARLY, (INSERT PAGE 3 OF HARD-COPY HERE). CURRENTLY WORKING WITH CANADA TO EXTEND THESE STUDIES, USING A COLONY OF SOME 80 MONKEYS.

THE LOWEST OBSERVED EFFECT LEVEL (LOEL) IN THESE STUDIES IS APPROXIMATELY 1 PPM IN THE DIET OR, ROUGHLY, .05 MG/KG-D.

QUANTITATIVE RISK EXTRAPOLATION IS NOT USUALLY PERFORMED WITH DATA ON REPRODUCTIVE EFFECTS. RATHER, A MEASURE OF THE RISK INVOLVED IS PRESENTED AS A RATIO BETWEEN THE LOEL (IN THIS CASE) AND THE ESTIMATED EXPOSURE.

III. EXPOSURE

NO MATTER HOW HAZARDOUS A SUBSTANCE MIGHT BE, IF IT NEVER COMES INTO CONTACT WITH PEOPLE, THE HUMAN HEALTH RISK WILL BE ZERO. THEREFORE, THE EXTENT OF THE HEALTH RISK POSED BY THE PCBs AT THE LEHIGH ELECTRIC CO. SITE DEPENDS ON THE EXTENT TO WHICH PEOPLE COME INTO CONTACT WITH THEM; I.E. THE EXPOSURE.

BECAUSE IT IS NOT POSSIBLE TO FORESEE ALL POSSIBLE EVENTUALITIES THAT MIGHT RESULT IN EXPOSURE TO THE LEHIGH ELECTRIC PCBs, TWO SEPARATE SCENARIOS WILL BE PRESENTED TO INDICATE REASONABLE LEVELS OF EXPOSURE FOR THE "NO ACTION" OPTION. THE FIRST OF THESE SCENARIOS IS BUILT ON RELATIVELY HIGH EXPOSURE, LOW PROBABILITY ASSUMPTIONS. THIS SCENARIO MIGHT BE REFERRED TO AS "PLAUSIBLE, WORST CASE". A SECOND SCENARIO IS BASED ON MORE MODERATE EXPOSURES AND IS MORE LIKELY TO REPRESENT A REAL SITUATION AT THE SITE.

BOTH SCENARIOS MAKE USE OF THE DATA COLLECTED AT THE SITE BY EPA AND/OR ITS CONTRACTOR.

THE SECTION CLOSES WITH A DISCUSSION OF ANTICIPATED EXPOSURE AFTER REMEDIAL WORK.

A. THE DATA

AFTER REMOVAL OF THE ELECTRICAL EQUIPMENT FROM THE SITE DURING PHASE I OF THE CLEANUP, THE AGENCY OBTAINED BORE SAMPLINGS FROM EACH GRID. BORE SAMPLES WERE TAKEN DOWN TO A DEPTH AT WHICH THE PCB CONCENTRATION FELL BELOW 10 PPM. A CONSCIOUS EFFORT WAS MADE TO DRILL AT POINTS ON THE SECTIONS WHICH ARE MOST VISUALLY CONTAMINATED.

POSITIVE VALUES OF PCB RESIDUES WERE FOUND IN THE SEDIMENTS OF THE NEARBY LACKAWANNA RIVER. THIS CONTAMINATION COULD HAVE RESULTED FROM EROSION OF CONTAMINATED SOIL FROM THE ELEVATED SITE.

CALCULATIONS BASED UPON THESE DATA SUGGEST THAT THE MAGNITUDE OF PCBs IN THE CONTAMINATED AREA IS 25,000KG.

THE POINT OF HIGHEST CONCENTRATION OF PCBs IN THE SOIL ON THE SURFACE WAS MEASURED AT 110,000 PPM (OR 11% PCBs). THE AVERAGE CONCENTRATION OF PCBs ON THE SURFACE OF THE SECTIONS WHICH WERE FOUND TO BE CONTAMINATED AT LEVELS IN EXCESS OF 50 PPM WAS CALCULATED TO BE APPROXIMATELY 3700 PPM.

B. EXPOSURE SCENARIOS UNDER "NO ACTION" OPTION

ALTHOUGH THE AREA IS CURRENTLY FENCED, THE BOUNDARY CLEARLY HAS BEEN BREACHED ON MORE THAN ONE OCCASION. IN THE FOLLOWING SCENARIOS THE ASSUMPTION IS MADE THAT PEOPLE CAN CONTACT THE CONTAMINATED SOIL FOR 1 HR/D FOR 180D/YR (TO ACCOUNT FOR ICE AND SNOW COVER IN WINTER, APERIODIC ACCESS TO THE SITE, ETC.).

THE POSSIBLE ROUTES OF EXPOSURE WHICH MUST BE CONSIDERED ARE INGESTIVE, DERMAL ABSORPTION, AND INHALATION. TABLES I & II LAY OUT THE ASSUMPTIONS USED IN THE TWO SCENARIOS. TABLE III LAYS OUT ADDITIONAL ASSUMPTIONS WHICH ARE COMMON TO BOTH SCENARIOS.

TABLE I

ASSUMPTIONS FOR PLAUSIBLE WORST CASE

INGESTION ASSUMPTIONS

1 G SOIL DAILY FOR 3 YEARS (CHILD)
.5G SOIL DAILY FOR 7 YEARS (YOUNGSTER)
.1G SOIL DAILY FOR 10 YEARS (ADULT -- LESS LIKELY TO BE IN
THE AREA)
100% OF PCBS ON SOIL ARE BIOLOGICALLY AVAILABLE

DERMAL ASSUMPTIONS

1G SOIL ON SKIN DAILY FOR 20 YEARS IN A LIFETIME
10% OF PCBS PENETRATE SKIN

INHALATION ASSUMPTIONS

BREATHING RATE WHILE IN THE AREA 20M3/D
DUST LEVEL IN THE AIR IS 100 MICROGRAMS/M3; AT AMBIENT AIR
STANDARD OF 75 MICROGRAMS/M3
ALL PARTICLES CAN BE INHALED
ALL PARTICLES INHALED ARE RETAINED
ALL PCBS ON RETAINED PARTICLES BECOME BIOLOGICALLY AVAILABLE.

TABLE II

ASSUMPTIONS FOR MORE LIKELY SCENARIO

INGESTION ASSUMPTIONS

.1G DAILY FOR 20 YEARS IN A LIFETIME
100% OF PCBS ON SOIL ARE BIOLOGICALLY AVAILABLE

DERMAL ASSUMPTIONS

.1G SOIL ON SKIN DAILY FOR 20 YEARS IN A LIFETIME
1% OF PCBS PENETRATE SKIN

INHALATION ASSUMPTION

SAME AS TABLE I.

TABLE III

OTHER ASSUMPTIONS COMMON TO BOTH SCENARIOS

70KG PER PERSON ("FINE TUNING" THE WEIGHT OVER A LIFETIME IS ASSUMED TO HAVE A NEGLIGIBLE EFFECT ON THE SIGNIFICANCE OF THE DATA)

1HR EXPOSURE PER DAY FOR 182 DAYS PER YEAR

IN ADDITION TO THESE DIRECT EXPOSURES TO HUMANS, THERE EXISTS THE POSSIBILITY OF INDIRECT EXPOSURES VIA CONTAMINATED WILD GAME, FISH, VEGETATION, ETC. THE EXTENT OF THIS EXPOSURE CANNOT BE EVALUATED AT THIS POINT DUE TO LACK OF INFORMATION ON FISH HARVESTING FROM THE RIVER, PCB LEVELS IN GAME, THE POTENTIAL FOR THE SITE TO SERVE AS A CURRENT OR FUTURE SOURCE OF VEGETATION THAT WOULD EVENTUALLY REACH HUMANS, ETC. THE READER SHOULD BE AWARE THAT A POTENTIAL FOR ADDITIONAL EXPOSURE MAY EXIST VIA THESE INDIRECT ROUTES, ALTHOUGH THEY ARE NOT EXPECTED TO BE AS LARGE AS THAT FROM DIRECT ROUTES.

CALCULATIONS

PLAUSIBLE WORST CASE

INGESTION

LIFETIME DAILY DOSE

$$= 1\text{G SOIL/DAILY} \times (\text{CONC. PCB IN SOIL}) \times (182/365) \text{ 3YRS/70YRS}$$

$$= .5\text{G SOIL/DAY} \times (\text{CONC. PCB IN SOIL}) \times (182/365) \text{ 7YRS/70YRS}$$

$$= .1\text{G SOIL/DAY} \times (\text{CONC. PCB IN SOIL}) \times (182/365) \text{ 10YRS/70YRS}$$

DIVIDED BY 70KG

$$= ((1000 \text{ MG SOIL/D} \times 1/2 \times 3/70) + (500 \text{ MG SOIL/D} \times 1/2 \times 1/10) + (100 \text{ MG SOIL/D} \times 1/2 \times 1/7))$$

CONC. PCB/70KG

$$= ((21 \text{ MG SOIL/D} + 25 \text{ MG SOIL/D} + 7 \text{ MG SOIL/D} (\text{CONC. PCB})/70\text{KG}))$$

$$= .75 (\text{CONC. PCB}) \text{ MG PCB/KG-D}$$

WHERE CONC. PCB IS EXPRESSED IN UNITS OF MG PCB/MG SOIL

DERMAL

LIFETIME DAILY DOSE

$$= 100 \text{ MG SOIL} \times (\text{CONC. PCB IN SOIL}) \times 182\text{D}/365\text{D} \times 20\text{YR}/70\text{YR} \times 10\%/70\text{KG}$$

$$= .2 (\text{CONC. PCB}) \text{ MG PCB/KG-D}$$

WHERE CONC. PCB IS EXPRESSED IN UNITS OF MG PCB/MG SOIL

INHALATION

LIFETIME DAILY DOSE

$$= (20 \text{ M}^3/\text{D} \times 1\text{HR}/\text{D} \times \text{D}/24\text{HR} \times 182\text{D}/365\text{D} \times 20\text{YRS}/70\text{YRS} \times 100\text{MG SOIL}/\text{M}^3 \times \text{CONC. PCB})/70 \text{ KG}$$

$$= .0002 (\text{CONC. PCB}) \text{ MG PCB/K-D}$$

WHERE CONC. PCB IS EXPRESSED IN UNITS OF MG PCB/MG SOIL

NOTE THAT THE INHALATION DOSE IS NEGLIGIBLE COMPARED TO THE INGESTION OR DERMAL ROUTES. THEREFORE, THE COMBINED DOSE IS ESSENTIALLY:

$$\text{TOTAL LIFETIME DOSE} = .95 (\text{CONC. OF PCB}) \text{ MG PCB/KG-D} \quad (1)$$

WHERE CONC. PCB IS EXPRESSED IN UNITS OF MG PCB/MG SOIL

MORE LIKELY SCENARIO

INGESTION

LIFETIME DAILY DOSE

$$= (100 \text{ MG SOIL/D} \times \text{CONC. PCB IN SOIL} \times 182\text{D}/365\text{D} \times 20\text{YRS}/70\text{YRS})$$
$$/70\text{YRS}$$

$$= .2 (\text{CONC. PCB IN SOIL}) \text{ MG PCB/KG-D}$$

DERMAL

LIFETIME DAILY DOSE

$$= (100 \text{ MG SOIL/D} \times \text{CONC. PCB IN SOIL} \times 182\text{D}/365\text{D} \times 20\text{YRS}/70\text{YRS} \times 1\%)$$
$$/70\text{KG}$$

$$= .02 (\text{CONC. PCB}) \text{ MG PCB/KG-D}$$

INHALATION

SAME AS PLAUSIBLE WORST CASE; STILL NEGLIGIBLE.

THEREFORE, THE TOTAL LIFETIME DAILY DOSE = .22 (CONC. PCB) MG PCB/KG-D
(2)

WHERE CONC. PCB IS EXPRESSED AS MG PCB/MG SOIL.

C. EXPOSURE AFTER REMEDIAL WORK

THE PLANNED REMEDIAL OPTION INVOLVES EXCAVATION DOWN TO A LEVEL OF FROM ONE TO 14 FEET UNTIL THE PCB CONCENTRATION IN THE REMAINING CONTAMINATED SOIL IS SOMEWHERE BETWEEN 10 AND 50 PPM. THE ESTIMATED AMOUNT OF PCBs WHICH WILL BE REMOVED IS 27 TONS. THIS IMPLIES THAT ABOUT 98% OF THE ORIGINAL AMOUNT WILL REMAIN.

THE EXCAVATION WILL THEN BE BACKFILLED WITH PCB FREE DIRT. SUBSEQUENTLY, THE ENTIRE LOT (EXCAVATED AND NON-EXCAVATED) WILL BE COVERED WITH 6" OF FRESH SOIL AND SEEDED.

ONCE THIS REMEDIAL WORK IS COMPLETED, THE SURFACE CONCENTRATIONS OF PCBs FROM THE SITE WILL BE ESSENTIALLY ZERO, AND HENCE THE RISK FROM DIRECT EXPOSURE WILL ALSO BE ESSENTIALLY ZERO.

THE POSSIBILITY OF MOVEMENT OF ANY REMAINING PCBs THROUGH THE GROUND WATER IS NOT CONSIDERED LIKELY, GIVEN THE RELATIVELY STRONG BINDING PROPERTIES OF PCBs TO SOIL, IN RELATION TO THEIR RELATIVELY LOW SOLUBILITIES IN WATER.

IT IS CONCEIVABLE THAT OVER TIME, PCBs COULD CO-VAPORIZE WITH WATER IN THE SOIL AND RISE TO THE SURFACE. THIS IS LIKELY TO BE A VERY SLOW PROCESS AND, GIVEN THE LOW AMOUNT OF PCBs REMAINING IN THE SOIL AT THE EXCAVATED DEPTHS AND THE FACT THAT PCBs WOULD VAPORIZE AND MOVE OFF-SITE AT VERY LOW CONCENTRATIONS, IT IS NOT THOUGHT THAT PCBs WOULD EVER AGAIN BE PRESENT AT THE SURFACE IN CONCENTRATIONS THAT WOULD BE OF CONCERN.

IV. RISK

AS MENTIONED ABOVE, THE CAG OF EPA HAS DETERMINED AN UPPER LIMIT TO THE EXCESS RISK FROM CANCER DUE TO PCBs TO BE THE LIFETIME DAILY DOSE.

UPPER LIMIT OF CANCER RISK = 4.35 (MG/KG-D)⁻¹ (LIFETIME DAILY DOSE)
WHERE LIFETIME DAILY DOSE IS EXPRESSED IN LIMITS OF MG/KG-D.

THIS RELATIONSHIP HOLDS AT LOW DOSES. AT HIGHER DOSES WHERE THE DOSE-RESPONSE FUNCTION IS SUBLINEAR, THE EQUATION OVER-ESTIMATES THE UPPER LIMIT OF THE RISK. GIVEN THE COARSENESS IN THE REST OF THE RISK ASSESSMENT PRESENTED HERE, HOWEVER, THE NON-LINEAR CORRECTION HAS NOT BEEN MADE IN THIS PAPER. THE EFFECT OF THIS IS TO INTRODUCE ANOTHER CONSERVATIVE ASSUMPTION.

FIGURE I ILLUSTRATES THE UPPER LIMIT OF THE EXCESS CANCER RISK OF BOTH THE PLAUSIBLE WORST CASE SCENARIO AND THE MORE LIKELY SCENARIO AS A FUNCTION OF CONCENTRATIONS OF PCBs IN THE SOIL. THE VERTICAL LINES AT 110,000 PPM AND 3700 PPM REPRESENT, RESPECTIVELY, THE DOSE AT THE "HOTTEST" SPOT FOUND AND THE AVERAGE OF THE DOSES AT EACH OF THE GRID SECTIONS WHICH SHOWED CONCENTRATIONS OF PCBs IN EXCESS OF 50PPM.

NOTE THAT THE ORDINATE ALSO DISPLAYS VALUES FOR THE RATIO (CR) OF THE LOEL TO THE ANTICIPATED DOSE.

THE GREATER THE VALUE OF THE RATIO, THE GREATER IS ONE'S CONFIDENCE THAT THE EXPOSURES ARE NOT SIGNIFICANT FROM A DIRECT HUMAN HEALTH PERSPECTIVE.

FOR THE PLAUSIBLE WORST CASE SCENARIO, THEREFORE, WE HAVE (USING EQ. (1) IN EQ. (3))

$$\begin{aligned}\text{UPPER LIMIT OF EXCESS CANCER RISK} &= 4.35 \times .95 \times \text{CONC. PCB} \quad (4) \\ &= 4.1 \times \text{CONC. PCB}\end{aligned}$$

SIMILARLY, FOR THE MORE LIKELY SCENARIO, WE HAVE (USING EQ. (2) IN EQ. (3)):

$$\begin{aligned}\text{UPPER LIMIT OF EXCESS CANCER RISK} &= 4.35 \times .22 \times \text{CONC. PCB} \\ &= .96 \times \text{CONC. PCB} \quad (5)\end{aligned}$$

V. DISCUSSION

FIGURE I ILLUSTRATES THAT, WITHIN THE BOUNDS OF THE APPROXIMATIONS USED IN THIS PAPER, EXPOSURES RESULTING FROM THE "PLAUSIBLE WORST CASE" AND THE "MORE LIKELY SCENARIO" GIVE UPPER LIMITS OF EXCESS CANCER RISK AND MEASURES OF REPRODUCTION RISKS WHICH ARE IN THE RANGES THAT GENERALLY CAUSE CONCERN. THIS IS TRUE FOR BOTH THE HIGHEST POINTS OF CONTAMINATION (110,000 PPM) AND THE AVERAGED CONCENTRATION (3,700 PPM).

RECALL THAT THE CANCER ESTIMATES HAVE NOT BEEN CORRECTED FOR NONLINEAR BEHAVIOR AT HIGH DOSES AND, THEREFORE, ARE OVERESTIMATES TO SOME DEGREE. THESE CORRECTIONS ARE NOT LIKELY TO REDUCE THE UPPER LIMIT ESTIMATES TO LEVELS WHICH WILL NO LONGER BE OF CONCERN. THIS IS PARTICULARLY TRUE OF THE 110,000 PPM CONTAMINATION LEVEL.

IN ANY EVENT, THE MEASURES OF REPRODUCTION RISK, THE CR VALUES, DO NOT NEED TO BE CORRECTED AND, QUITE INDEPENDENTLY, THEY CONVEY THE SAME INFORMATION: THE "NO ACTION" OPTION RESULTS IN EXPOSURES WHICH ARE OF SOME CONCERN. GENERALLY, ONE WOULD LIKE TO SEE CR VALUES IN EXCESS OF 100 OR 1,000. THE "NO ACTION" OPTION RESULTS IN CR VALUES IN THE LESS THAN 1 TO 100 RANGE.

IN SUM, IF THE DIRECT EXPOSURE SCENARIO ASSUMPTIONS SUMMARIZED IN TABLES I - III ARE ACCEPTED, THE "NO ACTION" OPTION IS ASSOCIATED WITH RISKS OF CONCERN.

AS STATED ABOVE, THE PROPOSED REMEDIAL ACTION WILL REDUCE SURFACE CONCENTRATIONS TO EFFECTIVELY ZERO. HENCE, THE RISK FROM DIRECT EXPOSURE WILL ALSO BE EFFECTIVELY ZERO. WE HAVE NOTED THAT THERE IS SOME POSSIBILITY FOR INDIRECT EXPOSURES AND, POSSIBLY, FINITE DIRECT EXPOSURES OVER TIME. FOR REASONS CITED IN SECTION III C, HOWEVER, THESE EXPOSURES (AND HENCE THE RISKS) ARE NOT LIKELY TO BE SIGNIFICANT.

VI. CONCLUSION

THE PROPOSED REMEDIAL ACTION WILL MARKEDLY REDUCE MOST (PERHAPS ALL) OF THE RISK, WHICH IS OF LIKELY CONCERN AT THE LEHIGH ELECTRIC SITE.